REMARKS

The Office Action dated February 28, 2003 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Accordingly, claims 1-3 are pending in this application and are submitted for consideration.

Applicant acknowledges and thanks the Examiner for indicating that claim 2 would be allowable over the prior art if amended to be in independent form. However, Applicant respectfully submits that all of the presently pending claims recite allowable subject matter and therefore, placing claim 2 into independent form is not necessary.

Fig. 2 was objected to for a typographical error. By this Amendment, Figs. 2, 3a, 3b are amended to correct typographical errors. Figs. 4, 5a, 5b and 5c are labeled as -- Prior Art --. Additionally, Fig. 2 has been amended to further clarify the invention. No new matter has been entered.

Applicant respectfully requests that the objections be withdrawn.

The specification was objected to for several informalities. By this amendment, the specification has been amended to further clarify the invention. No new matter has been entered.

Applicant respectfully requests that the objection be withdrawn.

Claim 1 was rejected under 35 U.S.C. § 102(e) as being anticipated by Itoh et al. (U.S. Patent No. 5,757,937, "Itoh"). In making this rejection, the Office Action took the position that Itoh discloses all the elements of the claimed invention. However, the Applicant respectfully submits that claim 1 recites subject matter that is neither disclosed nor suggested in Itoh.

The present application relates to detecting a noise level value (scalar amount) of the input signal in real time, and updating the value of the noise level (scalar amount) stored in the noise level holding section based on the detected value.

Claim 1 recites a noise level updating system including a detector means for detecting a noise level of an input signal and a noise level holding section for holding a noise level detected by the detector means as a reference value. A determining means is provided for determining updating of the noise level held in the noise level holding section based on a plurality of subsequent noise levels. An updating means is provided for updating the held noise level in accordance with determination of the determining means.

In making this rejection, the Office Action took the position that Itoh discloses all of the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the structure of the claimed invention, and therefore, fails to provide the advantages of the present invention. For example, the noise level updating system of the present invention is configured to have a detector means for detecting a noise level of an input signal and a noise level holding section for holding a noise level detected by the detector means as a reference value. A determining means determines updating of the noise level held in the noise level holding section based on a plurality of subsequent noise levels. An updating means updates the held noise level in accordance with determination of the determining means.

With this arrangement, the present invention provides a noise reduction system that removes noise even if the level of noise changes.

Itoh discloses an acoustic noise suppressor circuit which suppresses signals, other than speech. As shown in Figure 2, element 20 is an analysis/discrimination part, element 30 is a weighted noise suppressing part, element 24 is a maximum value detecting part and element 25 is a speech/non-speech identification part. The analysis/discrimination part 20 outputs the result of a decision as to whether the input signal is a speech signal or noise signal. Element 30 includes a frequency analysis part (FFT) 31, a noise spectrum update/storage part 33, a psychoacoustically weighted subtraction part 34 and an inverse frequency analysis part 35. The noise spectrum update/storage part 33 performs a weighted addition of newly added noise spectrum and a previous updated noise spectrum to obtain an averaged updated noise spectrum. The psychoacoustically weighted subtraction part 34 multiplies the updated noise spectrum by the psychoacoustically weighted coefficient and subtracts the psychoacoustically weighted noise spectrum from the spectrum provided from the frequency analysis part 31 to thereby suppress noise.

According to Itoh, the speech/non-speech identification part 25 discriminates whether the object is voice sound or noise, and only when it determines the object to be noise, the Fourier-transformed spectrum and the past spectrum, as stored in the noise spectrum update/storage part 33, are placed in the weighted-average, so that the spectrum in the noise spectrum update/storage part 33 is updated.

The Office Action took the position that Itoh discloses a detector means 31 shown in Fig. 2, a noise level holding section 33, determining means 20 and updating means (eq. 2). However, it appears that 31 is merely a frequency analyzer, not a detector for detecting a noise level (scalar quantity). ^ yes

Also, the input signal S(f) of Fig. 8 is not a detection means, but is a frequency band signal in which an input signal is Fourier-transformed. Input signal S(f) is also a noise characteristic represented by two dimensions comprising the spectrum level and the frequency, not the scalar quantity. Therefore, the noise level, as a scalar quantity cannot be represented by S(f) as a two-dimensional indication quantity. Therefore, the detector means for detecting noise level, as recited in claim 1 of the present invention is neither disclosed nor suggested in Itoh.

Furthermore, in Itoh, 20 determines whether the input signals are voice or non-voice. Therefore, Itoh fails to disclose or suggest determining means for determining updating of the noise level held in the noise level holding section based on a plurality of subsequent noise levels, as recited in claim 1.

Further, equation 2 only calculates the updated quantity of the noise spectrum characteristic represented by two dimensions comprising the spectrum level and the frequency. Equation 2 does not update the noise level as a scalar quantity as in the present invention, wherein an updating means updates the held noise in accordance with the determining means, as recited in claim 1.

Moreover, it appears that Itoh only discloses a noise spectrum update/storage part 33, not the noise level holding section, as recited in claim 1 of the present invention.

Thus, it is respectfully submitted that the Applicant's invention, as set forth in claim 1, is not anticipated within the meaning of 35 U.S.C. § 102.

Claims 1 and 3 were was rejected under 35 U.S.C. § 102(e) as being anticipated by Satoh et al. (U.S. Patent No. 5,293,588, "Satoh"). In making this rejection, the Office

Action took the position that Satoh discloses all the elements of the claimed invention. However, the Applicant respectfully submits that claims 1 and 3 recite subject matter that is neither disclosed nor suggested in Satoh.

Satoh discloses a speech detection apparatus that is not effected by input energy or background noise levels.

As shown in Fig. 1, the speech detection apparatus of Satoh includes an input terminal 100 for inputting audio signals, a parameter calculation unit 101 is provided for acoustically analyzing each input frame of the input signal to extract a parameter. A noise segment pre-estimation unit 122 pre-estimates the noise segments in the input audio signals. A noise standard pattern construction unit 127 is provided for constructing the noise standard patterns by using the parameters of the input frames which are pre-estimated as noise segments by the noise segment pre-estimation unit 122. A judging unit 120 judges whether the input frame is speech or noise by using the noise standard patterns. An output terminal 105 is provided for outputting a signal indicating the input frame as speech or noise according to the judgment made by the judging unit 120.

As shown in Fig. 16, pre-estimation unit 122 includes an energy calculation unit 123 that calculates an average energy P(n) of the n-th input frame. The threshold comparison unit 125 estimates the input frame as speech or noise by comparing the calculated average energy P(n) of the n-th input frame with a threshold T(n). The threshold updating unit 124 updates the threshold T(a) to be used by the threshold comparison unit 125.

In the present invention, HPF of the input signal is output through a rectification circuit and LPF, the minimum value of the output is treated as a noise level. On the other hand, although Satoh extracts the characteristic parameter from the input signals, Satoh fails to disclose or suggest the subject matter of the present invention.

The Office Action took the position that in Satoh, element 101 represents the detecting means as recited in claim 1, element 124 represents the noise level holding section recited in claim 1, elements 26 or 28 represent the claimed determining means as recited in claim 1 of the present invention, and elements 27 or 29 represent the updating means of the claimed invention.

However, upon review of Fig. 15, Applicants respectfully disagree with the characterization of the reference. Although Satoh is capable of discriminating a speech signal from a noise signal, 101 appears to only be a calculation apparatus for the characteristic parameter, not a noise level detecting means for detecting a noise level of an input signal, as in claim 1 of the present invention.

Also, 124 of Satoh is an updating unit for the energy threshold value, not a noise level holding section. Further, equations 26 and 28 are calculation functions that compare the calculated energy P with the threshold value T, not determining means for determining updating of the noise level held in the noise level holding section based on a plurality of subsequent noise levels, as recited in claim 1 of the present invention.

Further, formulas 27 and 29 of Satoh represent a decision method for updating the threshold value T, which is contrary to the updating means of claim 1, which updates the held noise level in accordance with the determination of the determining means.

Additionally, in the present invention, the determining means determines the updating of a held noise level when the difference between an average value of the subsequent noise levels and the held noise level is larger than a predetermined value, as recited by claim 3. This is neither disclosed nor suggested in Satoh.

Thus, it is respectfully submitted that the Applicant's invention, as set forth in claim 1, is not anticipated within the meaning of 35 U.S.C. § 102.

Still further, as claim 3 depends from claim 1, Applicant submits that claim 3 incorporates the patentable aspects thereof and are therefore allowable for at least the same reasons as discussed above with respect to claim 1.

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1 and 3 (claim 2 already being indicated as reciting allowable subject matter, and the prompt issuance of a Notice of Allowability are respectfully solicited.

If this application is not in condition for allowance, the Examiner is requested to contact the undersigned at the telephone listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper,

may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 107156-09012.**

Respectfully submitted,

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Enclosures: Figs. 2-5
Petition for Extension of Time (two months)